Jun 6th, 1:50 PM - 2:10 PM

Session A5 - History of Design for the Passage of River Herring in the Northeast

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Design for the Passage of River Herring in the Northeast

Fish Passage Engineering Team

- R5 Fisheries has a team of engineers working in fish passage with 70+ years of combined experience
- work with FWS biologists, as well as agency, NGO and private partners
- extensive experience designing for passage of river herring

Team Members

- Team Leader: Curt Orvis, P.E.
- Engineering Team: Bryan Sojkowski
  Brett Towler, Ph.D., P.E., P.H.
  Brian Waz, P.E.
  Ken Brownell, P.E

- SCEP Interns: Katey Plymesser, P.E. *
  Jesus Morales **

* *Ph.D. candidate in engineering at MSU-Bozeman*

** *M.S. student in civil engineering at UMass-Amherst*

Fishway design criteria in the northeast is driven by the following parameters:

- target species → Atlantic salmon
- swimming ability → American shad
- biologic loading → river herring

Species	Duration In river	Timing	Homing	Behavior	Diurnal Behavior	Sustained Swimming Speed (ft/s)
blueback herring	Several months	Upmigrate in spring; outmigrate late summer/fall	natal river	Not territorial; school during migration	Daytime only	3-10+
alewife	3-7 months	Upmigrate in spring; outmigrate summer-fall	natal river	Not territorial; school during migration	Daytime only	3-5
American shad	Several months	Upmigrate in spring; outmigrate late summer/fall	natal river	Not territorial; school during migration	Daytime only	2-15+
Atlantic salmon	1-3 years	Migrate in spring/fall	natal site	Territorial as juveniles; school as smolts	Anytime	5-15+

Elements Driving Design for River Herring

- Drop height → 9-12 inches
- Streaming flow
- Biologic loading → pool and hopper size
- Length of fishway
- Turbulence??

Example - difficulty with pool-type fishways …

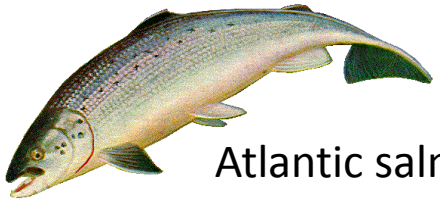
1. Increase flow to achieve streaming flow
2. Increase flow and velocity and turbulence increase
3. Increase pool size to decrease turbulence
4. Plunging flow occurs….no!

OR

4. Cost of fishway becomes excessive for small hydropower owners….

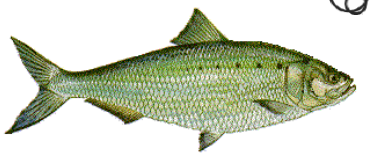
But I need to wait for all my friends and family…I'm not sure we're all going to fit

It's getting a bit dark… maybe we should just wait until tomorrow.



Atlantic salmon
Salmo salar

blueback herring
Alosa aestivalis



American shad
Alosa sapidissima

Come on you guys!
Just jump over it!

Jenny Grist Mill– Plymouth, MA

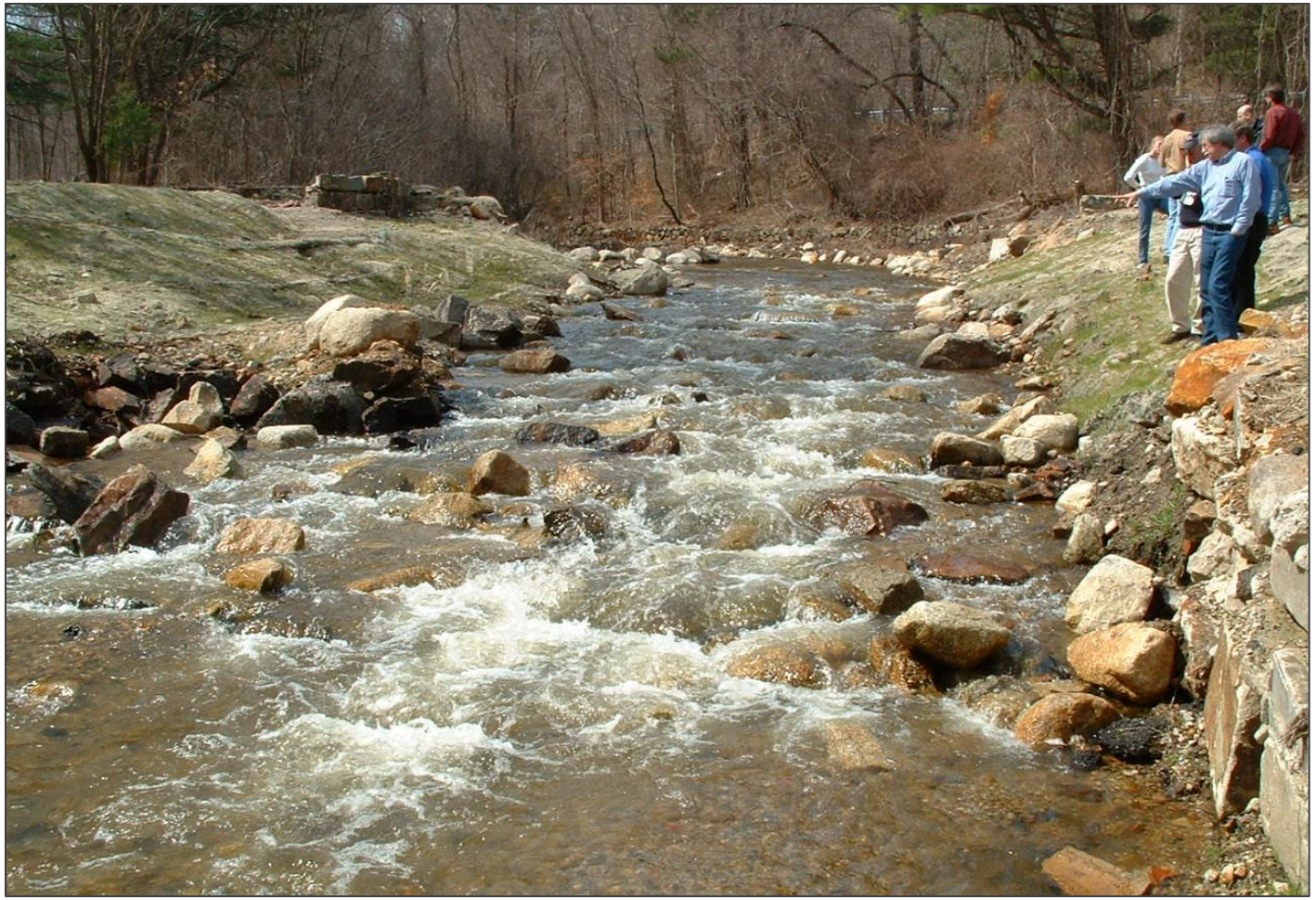
Boshers Dam– Richmond, VA

Herring Run Motel
Bournedale, MA

Damariscotta Mills
Nobleboro and Newcastle, ME

Benton Falls– Benton, ME

Town Brook – Plymouth, MA



What's Next?

- Continue to improve existing fishway structures to better accommodate river herring
- Move toward designing for an ecological community rather than target species
- Impacts of ESA listing for river herring….downstream passage?
- Effects of climate change

For technical assistance requests, contact:

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